BENCHMARKING IN FAVOUR OF PRODUCT PERFORMANCE

Eugen Falniţă
Professor, Ph D, University of the West, Timişoara

Abstract

Introducing new products and continuously improved products into the marketplace is essential to a company's competitive position and long term survival. Heightened competition, dynamic customer needs and wants are rendering products old fashioned at an every increasing pace. The solution is either innovate or die. Obviously, the former is the better.

One of the secrets for winning new and improved product effort, one that delivers successful, profitable and meaningful new and renewed products is the benchmarking.

This article reports the results of some benchmarking investigations after a benchmarking survey.

The benchmarking survey contains some considerations about the benchmarking concept, reasons for benchmarking, types of benchmarking, generic benchmarking process, benchmarking process steps, advantages, disheartened aspects, in concordance with Robert C. Camp, Michael J. Spendolini, Eugene E. Spraw, J. P. Russell, Robert Cooper, Carla O'Dell, Vicki J. Powers, Anne Feltus, Ian Malcolm, Peter Scott, Edith A. Wiarda, Nicolae Drãgulãnescu, Laura Giurcã Vasilescu, Cãtãlina Giurescu, Eugen Falnitã and other sources.

The benchmarking investigations contain examples out of the manufacturing centers included in manufacturing flexible systems, furniture included in interior amenities of the hotel room, ready-made clothes and blaugases. The first example is detailed with two questionnaires took over from one hundred companies; they contain 39 and 27 questions respectively. The results are marked with spider and column diagram examples, designed with one of the author's computer program. The others, briefly presented, contain one questionnaire each. The needed conclusions are given.

1. Definitions

The Xerox company is often presented as being one of tre first which achieved higher performance based on benchmarking. Benchmarking, according to Xerox, is the process of continuously evaluating our products, services and practices by comparison with our strongest competitors and acknowledged leaders world-wide (1). Scott (2), also invoking the Xerox company, defines benchmarking as finding and implementing the best practices. Oakland and Porter (3) also remark Xerox company's proximity to total quality management by means of benchmarking.

Spendolini (4) defines benchmarking as "A continuous, systematic, process for evaluating the products, services, and work processes of organisations that are recognised as

representing best practices for the purpose of organisational improvement" The purpose of organisational improvement refers to "organisational comparison, organisational improvement, meeting or surpassing industry best practices, *developing product*/process *objectives*, establishing priorities, targets, goals".

2. Classifications

Spendolini (5) distinguishes three types of benchmarking: internal, competitive, functional (generic). Internal benchmarking refers to similar activities in different locations, departments, operating units, countries, etc. Competitive benchmarking refers to direct competitors selling to same customer base. Functional benchmarking refers to organisations recognised as having state of the art products/services/processes.

The definitions of benchmarking might not suggest strongly enough that this comparison of the performances and processes is a complex process. The classifications of benchmarking seen in Olaru (6), in Engelkmeyer (7) - quoting (8), in Oakland and Porter (9) or in din James (10) - lead to the complete classification of benchmarking into four types: internal, competitiv, functional and generic. In internal benchmarking, comparisons are made between internal departments, divisions or regiments of the company, with easy data collection and identification of solutions for improvement, with relation to the company's own performance, but also with low possibility of attaining spectacular progress. In competitive benchmarking, comparisons are made with equal competitors - harder directly and much more easily through consultancy or third parties. In functional benchmarking, comparisons are made with similar processes of same functions of perform ant companies in the same domain, and especially outside it, of a great variety of industries and organisations, access to data being facilitated by non-involvement in competition but, rather, involvement in mutual interest through partnership. In the generic benchmarking, comparisons are made with the most innovative practices and highest levels of performance of some well-known companies (most often directly known), with leaders who may diminish confidence in the capability of obtaining own performance and in the reengineering of the business processes of those with which they are compared.

3. Stages

The classifications of benchmarking might, thus, sufficiently suggest the fact that this comparison of performance and processes is a complex process. The enumerations of the stages in approaching benchmarking, deriving from Olaru (11), from Enkelkmeyer (12), from Oakland and Porter (13), from James (14) lead to a complete grouping of eight stages. It follows the classical PDCA (Plan-Do-Check-Act), PEVA (Plan-Experiment-Check-Act) or PADIR (Plan-Analyse-Develop-Improve-Review): *1. planning of the study*; *2. identification* of most adequate infromation donating companies; *3. data collection*; *4. analysis of the collected data*; 5. *implementation* and development of economic measures for improvement; *6. monitoring* continuous evaluation of process scored; *7. consolidation of position gained*; *8. sharing of results*.

The present paper presents anly a few of the benchmarking stages here mentionad, by

means of examples.

4. Advantages of benchmarking in favour of performance

The enumeration of the stages in approaching benchmarking, besides the aspects presented before, induces, this time certainly, fear in approaching a complex and, obviously, costly process.

Nevertheless, there are reasons and advantages, as well as restrictions which lead successful benchmarking. The advantages of benchmarking include such aspects (15): provision of concrete objectives and relative performance indicators; development of openings in innovative approaces to other departments, organisations, etc., which positively affect the performance of processes; generation of an external vision, concurrently with internal concentration on critical managerial problems and processes; aquisition of knowledge by the top manager, for confronting competing companies; facilitation of development of strategic management plans, of organisational reengineering, of redesigning and restructuring initiatives; support for a leaving culture, of turning to account continuous improvement; concentration of results on performant objectives, obtained in correlation with proven external higher performance; sharing of information among process partners. Benchmarking is not a process which exposes the weak points of company nor does it penalise those responsible. Benchmarking is used to find domains and modalities of improvement, but also to reward those who being notable improvements

5. Four examples of benchmarking in favour of product performance

5.1. The first example

The example refers to the interest one out of three Romanian enterprises. The one in Oradea, especially, showed for improving product quality, machining centres and flexible machining cells, by carrying out a benchmarking study by means of questioning enterprises endowed with such indigenous or imported equipment.

The Oradea enterprise went through an internal benchmarking as comparisons were made with indigenous machining centres and flexible machining cells, a competitive benchmarking, as comparisons were made with indigenous producers of such centres an cells, directly but especially indirectly, by questioning indigenous customers of such centres and cells of indigenous producers, but a functional benchmarking was also gone through as comparisons were made with imported centres and cells products, based on prospectuses, specialised reviews, but also indirectly, by questioning indigenous users of centres and cells of foreign producers.

The firs questionnaire, consisting of 39 questions, was conceived along four global aspects. The first one, consisting of 10 questions, refers to the place of the enterprise, given by industrial branch, the average official number of employees the weight of production, the actual situation of the machining centres, their applicability. The second one, made

up of 10 questions, refers to the justification for the acquisition of new machining centres and flexible systems, the effects of the manner the equipment is installed. The third one, comprising 12 questions, refers to problems of integrating employees in the utilization of machining centres, training, effects on human resource. The fourth one, consisting of 7 questions, includes reference to preoccupations for equipment acquisition from various home and foreign suppliers characterised by quality of their products. The results of the questionnaire (16) have shown outstanding preoccupation with deeping and diversifying the production of centers and cells and have stimulated the continuation of the research, all the more so because one of the questions asked for grades between .1 and 1 for 27 characteristics of home and foreign equipment used in production. The arithmetical means of the grades set by the beneficiaries for centers and cells produced by home enterprises and imported ones are shown in Table 1

It can be noticed that the best position as concerns the synthetical indicator of the technical and qualitative level of the machining centers, behind the foreign producers, was held by the enterprise in Oradea, followed by the one in Bacău, then that in Bucharest. The ordering of the most important characteristics which were to be improved on comparing indigenous enterprises among themselves and against the imported ones, by presenting the most faulty characteristics in decreasing order is seen in Table 2.

Table 1. The arithmetical means of grades set for evaluation of characteristics

Nr	Name of characteristic	Oradea	Bacău	Buch arest	Import
	Technical characteristics	.77	.73	.60	.93
	Dimensional and construction characteristics referring to the table of the machine	.73	.74	.67	.90
1	Table	.80	.80	.70	.91
2	Pallet	.66	.78	.65	.70
3	Main spindle	.69	.82	.65	.95
4	Tool charge system	.79	.70	.61	.94
5	Size dimensions	.70	.80	.71	.96
6	Electronic component	.78	.68	.71	.87
7	Normal and speciall accessories	.72	.65	.68	.94
	Functional characteristics	.79	.76	.62	.96
8	Table strokes	.86	.87	.73	.97
9	Feeds	.85	.81	.65	.98
10	Main spindle	.74	.70	.80	.96
11	Tool charge system	.69	.62	.37	.98
12	Working accuracy	.80	.77	.61	.99
13	Automatic programming of the working range	.84	.85	.60	.96
14	Technological possibilities for machining, main operations	.82	.82	.65	.98
15	Idem, operations of serving, command, cheking, etc.	.79	.76	.64	.95
16	Machine productivity	.73	.65	.52	.92
17	Specific consumptions, energy, power, yield	.78	.70	.52	.92
18	Ergonomic, aesthetic, pollution characteristics	.73	.64	.52	.94

	Operation characteristics	.71	.71	.47	.87
19	Normed life-cycle	.75	.82	.51	.90
20	Availability	.74	.68	.50	.89
21	Reliability	.89	.65	.41	.83
22	Maintenance	.68	.68	.46	.89
	Economic Characteristics	.74	.72	.66	.86
23	Delivery price	.66	.70	.53	.83
24	Optional equipment delivery price	.70	.63	.73	.80
25	Annual operating costs	.75	.70	.56	.82
26	Annual operating costs for tools only	.72	.73	.74	93
27	Warranty term	.87	.88	.78	.92
	General view	.74	.70	.57	.90

Table 2. Important characteristics to be improved

Nr	Comparison of indigenous enterprises	Comparison with imported equipment
1	Construction-size characteristics	Functioning of tool charge system
2	Functioning of main spindle	Ergonomic, aesthetic, pollution characteristics
3	Optional equipment delivery price	Normal and special accesories construction
4	Annual operating costs	Machine productivity
5	Construction - pallet	Functioning of main spindle
6	Construction - main spindle	Maintenance
7	Normal and special accesories construc-tion	Construction - main spindle
8	Construction - electronic component	Reliability
9	Warranty term	Construction-size characteristics
10	Normal life-cycle	Functioning - working accuracy

5.2. The second example

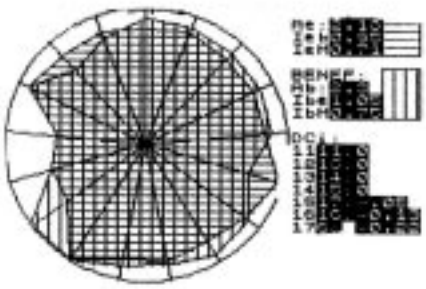

Figure 1. Spider diagram highlighting the global and partial characteristic gaps as well as highlighting of the order of priorities for improvement

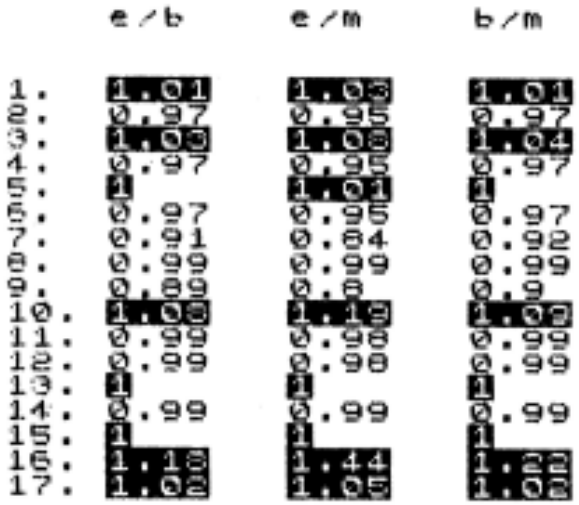

Figure 2. Representation of gaps between pairs of characteristics, highlighting the ones to be improved

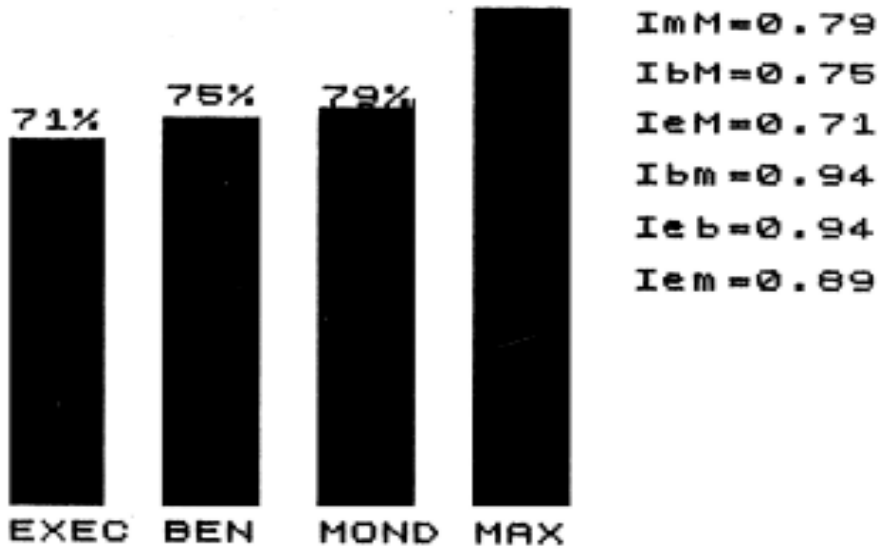

Figure 3. Column diagram representation of the global level of quality by comparing two indigenous models and an imported one with maximum level to be possibly reached

A second exemple refers to blaugases. Types of gas stores made by Satu Mare enterprise were compared to those of other home and foreign producers, by mean of questionnaires, grades being set for characteristics. For example, for the four ring store, grades were solicited from .1 to 1, depending on the degree of customer satisfaction with the quality of the products, for three types, for a number of 17 characteristics such as: height of store, width of store, depth of store, length of range, width of range, height of oven,

height of slot, width of slot, depth of slot, volume of oven, power of oven, number of trays, number of rings, colour, temperature indicator, ring location, power of gas store burner, oven window, design.
A second exemple refers to blaugases. Types of gas stores made by Satu Mare enterprise were compared to those of other home and foreign producers, by mean of questionnaires, grades being set for characteristics. For example, for the four ring store, grades were solicited from .1 to 1, depending on the degree of customer satisfaction with the quality of the products, for three types, for a number of 17 characteristics such as: height of store, width of store, depth of store, length of range, width of range, height of oven, height of slot, width of slot, depth of slot, volume of oven, power of oven, number of trays, number of rings, colour, temperature indicator, ring location, power of gas store burner, oven window, design.

Subsequent to data processing by means of a program developed by the author, representations resulted of the type of those in Figure 1, Figure 2, Figure 3, fom which conclusions were drawn concerning the order of priorities for improving the characteristics showing the largest gap as compared to the cooking stores of the best competitors; a simulation of the improvement followed, then questionnaires were administrated again and effects on quality was found out.

5.3. The third example

A third example refers to the interior amenities of a hotel room. Fro improving the interior amenities of the hotels in Timi^{o}ora, questionnaires were made out referring to furniture, including evaluation of beds, night stands tables, chairs, toilets, tapestry, furniture colour, furniture set, furniture location, clients by age group, profession, being questioned. Processing of questionnaires by procedures similar to those in the second example. It showed the preference of third age people for classical furniture, and of businessmen too, the young ones preferred the simple, more functional but modernised, new furniture in hotels.

5.4. The fourth example

A fourth example refers to ready-made clothes. To improve the quality of textile, leather and fur goods, of women' clothes, quetionnaires were made aout in two enterprises in Timi^{o}oara, the procedure following that in the pervious examples. They referred, on one hand, to silk blouses fro women, silk dresses, raincoats for women and, on the other hand, leather jackets and coats and mink, fox and sheep fur coats for women. The questionnaires referred to, for example, the collar, the pockets, the cuffs, the cut of the face, of the back, length, width, cut of sleeves, fastening, design. Conclusions were drawn from the questionnaires regarding to the order of priorities for improving the characteristics with the largest gap by changing the cut, etc.; then the questionnaires were administrated again and the effects on quality found out.

6.Conclusions

Interesting preoccupations with promoting benchmarking exist in the practice of firms

with a view to continuous improvement, but Romanian bibliography demonstrates that there is stiil room for embracing a modern procedure with continuous aapplication

(1) Olaru, M., 1997, "Benchmarking - modalitate de creştere a capacităţii concurenţiale a firmei", *Tribuna calităţii*, nr. 1, ianuarie: 61-63, pp 61
(2) Scott, P., 1996, "Benchmarking", *Management Accounting*, July/August: 50, pp 50
(3) Oakland, J. S.; Porter, L. J., 1995, *Total Quality Management. Text with cases*, Oxford: Butterworh-Heinemann Linacre House, pp 181
(4) Spendolini, M. J., 1992, *The Benchmarking Book*, New York: AMACOM, pp 9,10
(5) idem (4), pp 17
(6) idem (1), pp 62, 63
(7) Engelkemeyer, S. W., 1998, "Applying Benchmarking in Higher Education: A Review of Three Case Studies", *Quality Management Journal*, Vol.4, No. 4: 23-31, pp 181
(8) Camp, R. C., 1989, *Benchmarking: The search for industry best practices that lead to superior performance*, Milwaukee, Wisc.: ASQC Quality Press
(9) idem (3)
(10) James, P., 1996, *Total Quality Management: an introductory text*, Hemel Hempstead Hertfordshire: Prentice Hall Europe, pp 106
(11) idem (1) pp. 63
(12) idem (7), pp 24
(13) idem (3), pp.182, 183
(14) idem (10), pp 104, 105, 110
(15) Falniţă, E., 2000, "Benchmarking şi întreprinderile mici şi mijlocii", *VEB-Viaţa Economică Bănăţeană*, anul XI, mai, nr. 53: 16, 19, pp 19
(16) Falniţă, E., Petrişor, I., Bizerea, M., 1992, "Aprecieri ale utilizării centrelor de prelucrare de către beneficiari autohtoni", *Studii de Economie*, Vol. XIII: 57-64

Bibliography

1. Falniţă, E., 1992a, "Aprecieri ale nivelului tehnic şi calitativ al centrelor de prelucrare autohtone comparativ cu cele de import", *Studii de Economie*, Vol. XIII: 73-80
2. Falniţă, E., 1992b, "Preocupări la nivel mondial pentru creşterea producţiei şi a vânzărilor de maşini unelte şi, în special, a centrelor de prelucrare utilizate în sisteme flexibile de fabricaţie", *Studii de Economie*, Vol. XIII: 65-72
3. Falniţă, E., 2000, "Benchmarking de proces sau de firmă", *VEB-Viaţa Economică Bănăţeană*, anul XI, februarie, nr. 52: cop. 3
4. Giurcă Vasilescu, L., 2000, " Benchmarking - o nouă perspectivă", *VEB-Viaţa Economică Bănăţeană*, anul XI, februarie, nr. 52: 14, 15
5. Spraw, E., 1994, *Benchmarking Manufacturing Process. Your practical guide for becoming best class*, Deaborn: SME